REMARKS

The Official Action of March 24, 2004, and the prior art cited and relied upon therein have been carefully reviewed. The claims in the application are now claims 21-26, and these claims define patentable subject matter warranting their allowance. Accordingly, applicants respectfully request favorable reconsideration and allowance.

Acknowledgement by the PTO of the receipt of applicants' papers filed under §119 is noted.

Claims 1-20 have been rejected under the second paragraph of Section 120. This rejection is respectfully traversed.

The desk dictionary of undersigned (the *Random House College Dictionary*, revised edition of 1975) defines "primarily" as "essentially; mostly; chiefly; principally." Thus, there is nothing wrong with the word "primarily" as its meaning is clear and well understood: it simply means that most of the composition of the layer is the resin *per se*, although other components may be included in minor amounts. For example, applicants' specification at page 8, lines 20-21, gives an example of polytetrafluoroethylene (PTFE) containing some lead (Pb) powder.

Nevertheless, in deference to the examiner's views and to avoid excessive argumentation, the term "primarily" has been replaced by the word "mainly", explicit support being found for example in applicants' specification at page 1, line 6 and in the Abstract at lines 3 and 4.

Such amendment is of a formal nature only, i.e. made to place the claims in a form more acceptable to the examiner's understanding of what is necessary or desirable under U.S. practice. Such amendment is not a "narrowing" amendment because the scope of the claims has not been reduced in this regard. No limitations have been added in this regard and none are intended.

In the redrafting of applicants' claims as new claims 21-26, the applicants have avoided the criticized expression "without cutting there". The new claims specify "without cutting the resin layer". Again, however, applicants believe that the original language would be very clear to those skilled in the art, particularly when the claims are considered in light of applicants' specification (fully consistent with the law), and therefore the claims in their original form are fully in accordance with Section 112.

The amendments made in reply to the rejection under the second paragraph of Section 112 are not "narrowing" amendments because the scope of the claims has not been

reduced in those regards. Such amendments are not substantial amendments relating to patentability, but instead relate only to form.

Applicants respectfully request withdrawal of the rejection based on Section 112.

Claims 1, 2, 5, 8, 9, 15, 16, 19 and 20 have been rejected as obvious under Section 103 from Reising U.S. patent 3,574,429 ("Reising") in view of the definition of the term "jig" appearing in the 10th edition of Webster's Collegiate Dictionary. In addition, claims 3, 4, 6, 7, 17 and 18 have been rejected as obvious over the same combination further in view of Al et al U.S. patent 3,958,595 ("Al"); claims 10, 11, 13 and 14 have been rejected as obvious under Section 103 over the same combination as applied against claim 1 further in view of Jacobson U.S. patent 4,575,429 ("Jacobson"); and claim 12 has been rejected over the same prior art and for the same reasons as applied against claim 6, under Section 103, further in view of Jacobson. These rejections are all respectfully traversed.

All the rejections rely on Reising as the primary reference. But Reising is deficient in a way which is not acknowledged in any of the rejections, which deficiency is not made up by any of the subsidiary references, whereby

applicants' claims would not be reached even if the combinations as proposed were obvious.

Thus, Reising discloses the formation of a low friction or self-lubricating bearing in basically three steps. First, the lubricating strip which constitutes the bearing layer and comprises an open-celled resin foam impregnated with another resin is bonded to the interior cylindrical surface of a cylindrical metal member (e.g. column 3, lines 8-14). Second, the metal cylinder is then swaged to a spherical shape around a ball member (column 3, lines 14-17; column 3, lines 55-60) or alternatively an expansible mandrel is inserted within the lined cylinder and the assembly heated sufficiently to compress and cure the lining (column 4, lines 4-9).

Then, as a third step, the resultant construction is machined (column 3, lines 17-20; column 3, lines 67-69; column 4, line 11). The Office Action says that Reising "does not teach cutting anything at any point in the method"; but this is incorrect, because machining involves cutting.

Thus, Reising teaches that any desired machining operation is performed after removing the mandrel from the bearing (see e.g., lines 9-11 in column 4). Considering the technology at the time of Reising and at the time of filling the present application, the machining operation can be reasonably understood only as a cutting operation.

Further, according to Reising, the mandrel is heated together with the bearing (see lines 5-9 in column 4). This feature is different from that defined in new claim 1.

Accordingly, it should be understood that Reising does not teach finishing the bearing inner surface without the cutting operation. Rather, because Reising requires the machining operation, the roughness of the bearing inner surface before the machining operation would not be sufficiently smooth as compared to that of the present invention. Further, due to the machining operation, Reising will generate industrial wastes such as cutting or polishing powder. On the contrary, the present invention does not generate any industrial wastes, which therefore is environmentally friendly.

Further, Reising does not teach decreasing the roughness of the bearing inner surface by controlling the roughness of a peripheral surface of the mandrel, and improving the release property of the mandrel from the bearing inner surface. Also in view of this point, it is again noted that Reising will require the cutting operation to finish the bearing inner surface.

The rejection also states that Reising discloses a synthetic resin coating including PTFE. According to Reising,

the synthetic resin coating is formed by impregnating the PTFE into a open-cell phenol formaldehyde resin or the like. However, in the present invention, the impregnated and coated layer comprises a porous sintered layer consisting of Cu-alloy powder impregnated with synthetic resin (PTFE or thermosetting resin). Thus, applicants submit that Reising does not disclose the impregnated and coated layer of the present invention.

The Office Action states that Webster's dictionary defines "a jig" as "a device used to maintain mechanically the correct positional relationship between members". However, in the present invention, the jig holds the bearing so as to constrain its outward deformation, as stated in line 13 on page 10 of the original specification.

In general, a jig is a device used to mechanically maintain the correct positional relationship between members as stated in the dictionary, and thus is not made for constraining the deformation of the maintained members. As a result, any pressing force would not be uniformly applied to the bearing inner surface, in the case of the use of a general type jig. The present invention improves the smoothness of the bearing inner surface and the dimensional accuracy of the inner diameter of the bearing by adopting the above-defined

jig as well as the above-described mandrel of the present invention.

Accordingly, neither Reising alone nor Reising modified to include a general type holding jig of the type defined in the examiner's dictionary would reach any of applicants' claims.

Al discloses a butterfly valve in which a resin such as nylon is applied to an inner surface of a bore of the valve in order to reduce or prevent corrosion. This subject matter is unrelated to either the present invention or Reising. The person of ordinary skill in applicants' or Reising's art would not even be charged with knowledge of the entirely unrelated Al patent; and if such person skilled in the present art were charged with knowledge of Al, it would never occur to such a person to abstract anything from Al for incorporation into Reising. Accordingly, the proposed combination would not have been obvious absent some additional prior art which might lead the person of ordinary skill in the art of Reising to consider Al.

Regardless, substantially great smoothness is not a requirement of Al, and even if Al were obviously combined with Reising (contrary to applicants' position), the resultant combination would not reach any of applicants' claims for the

reasons pointed out above with respect to Reising alone or Reising as modified to incorporate a jig.

Jacobson relates to the art of the present invention and Reising, but does not teach applicants' improvement either alone or in combination with Reising (or for that matter with any other known prior art). Jacobson is substantially silent on the formation of the lubricating coating from the "mush" (which, incidentally, mostly consists of lead (Pb), as noted in the table at the top of column 8), except for stating (column 6, lines 55-58) as follows:

> No substantial modification of the processes employed for the preparation, application and sintering of such lining materials or blends is generally required.

The usual processes do involve cutting which is avoided in the present invention. Indeed, Jacobson suggests cutting at column 4, lines 15 and 16 as follows:

> The outer surfaces of the low friction layer are then **trued** to the desired physical confirmations... .

The term "trued" should be understood to mean trimming by cutting.

Because Jacobson requires cutting an inner surface of the bearing, cutting and/or polishing powder is generated

as industrial waste, which is environmentally undesirable. Further, in Jacobson, a cutting tool used for the cutting operation may contact the copper alloy in the porous sintered layer, so that any damage such as a chip of the cutting tool may be generated. Since the working life of the cutting tool is decreased, Jacobson will require frequent maintenance of the cutting tool.

Accordingly, Jacobson also does not make up for the deficiencies pointed out above in the other references, so that any combination of the references would not reach the claimed subject matter.

None of Reising, Al, Jacobson, and Webster's dictionary teaches finishing the bearing inner surface without any cutting operation, that is, finishing the bearing inner surface only by inserting a mandrel into the bearing inner surface to press the peripheral surface of the mandrel against the bearing inner surface and then pulling the mandrel from the bearing. In view of the technology level at the time of Reising, Al, and Jacobson, it can be recognized that the bearing inner surfaces thereof are finished by a machining operation, in particular cutting.

Applicants respectfully request withdrawal of the rejections based on Section 103.

Applicants respectfully request favorable reconsideration and allowance.

Respectfully submitted,

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